CLAIMS

1. A sawtooth wave generating apparatus for generating a sawtooth wave, the apparatus comprising:

a reference signal generating section for generating a reference signal having a predetermined frequency;

a sawtooth wave forming section which forms a sawtooth wave based on the predetermined frequency of the reference signal generated by the reference signal generating section; and

a correcting section which automatically corrects a slope of the sawtooth wave defined by $\Delta V/t$ which is formed by the sawtooth wave forming section in response to variation of the predetermined frequency of the reference signal.

2. The apparatus as claimed in claim 1, wherein the reference signal is a square-wave having rising edges and trailing edges, and the correcting section comprises:

a voltage comparator which compares the voltage of the sawtooth wave formed by the sawtooth wave forming section with a predetermined voltage;

a phase comparator which compares the phase of the rising edge of the reference signal generated by the reference signal generating section with the phase of the output signal from the voltage comparator; and

a low-pass filter which cuts out a high frequency component of the output signal from the phase comparator, and feeds back the resulting output signal to the sawtooth wave forming section.

3. The apparatus as claimed in claim 2, wherein the phase comparator outputs a low-level signal so as to make the value $\Delta V/t$ smaller in the case where the phase of the output signal from the voltage comparator is earlier than the phase of the rising edge of the reference signal, and the phase comparator outputs a high-level signal so as to make the value $\Delta V/t$ larger in the case where the phase of the output signal from the voltage comparator is later than the phase of the rising edge of the reference signal.

4. The apparatus as claimed in claim 1, wherein the reference signal generating section includes a base frequency generating section comprising a PLL circuit, and a frequency generating section for generating the reference signal based on the output signal from the base frequency generating section.

5. The apparatus as claimed in claim 2, wherein the sawtooth wave forming section includes a constant current circuit which outputs a constant current, a capacitor which is charged by the output current from the constant current circuit, and a semiconductor device for discharging the electric charge stored in the capacitor.

6. The apparatus as claimed in claim 5, wherein the semiconductor device includes an IGFET.

7. The apparatus as claimed in claim 5, further comprising a sawtooth wave discharging pulse section which controls discharge timing of the electric charge stored in the capacitor by outputting an on/off signal for the semiconductor device based on the output signal from the voltage comparator.

8. The apparatus as claimed in claim 5, wherein the constant current circuit is capable of controlling the amount of the output current based on the output signal from the low-pass filter.

9. The apparatus as claimed in claim 5, wherein the constant current circuit comprises a constant voltage source which outputs a constant voltage, a second FET for using a constant current characteristic of drain current, and a first FET for controlling the drain current of the second FET, a source electrode of the first FET being connected to a source electrode of the second FET;

wherein a gate electrode of the first FET is connected to the output side of the low-pass filter to control the amount of the output current from the constant current circuit, and both a gate electrode of the second FET and a drain electrode of the first FET are connected to the constant voltage source.

10. A method of generating a sawtooth wave, the method comprising the steps of:

generating a reference signal having a predetermined frequency, the reference signal being a square-wave having rising edges and trailing edges;

forming a sawtooth wave based on the generated reference signal;

comparing the phase of the rising edge of the reference signal with the phase of the apex of the formed sawtooth wave; and

automatically correcting a slope of the sawtooth wave defined by $\Delta V/t$ based on the result of the phase comparison.

11. The method as claimed in claim 10, wherein the automatically correcting step comprises:

generating a pulse signal when the voltage value of the sawtooth wave reaches a predetermined voltage value;

comparing the phase of the pulse signal with the phase of the rising edge of the reference signal; and

correcting the slope of the sawtooth wave so as to make the value $\Delta V/t$ smaller in the case where the phase of the pulse signal is earlier than the phase of the rising edge of the reference signal, and to make the value $\Delta V/t$ larger in the case where the phase of the pulse signal is later than the phase of the rising edge of the reference signal.

12. A constant current circuit which outputs a constant current, a current control device which resides outside of the constant current circuit being capable of controlling the amount of the output current of the constant current circuit, the circuit comprising:

a constant voltage source capable of outputting a constant voltage;

a second FET, a gate electrode of the second FET being connected to the output side of the constant voltage source, and a drain electrode of the second FET constituting an output terminal of the constant current circuit; and

a first FET capable of controlling the amount of the output current from the drain electrode of the second FET based on a control signal inputted from the current control device, a drain electrode of the first FET being connected to the constant voltage source and a gate electrode of the second FET, and a gate electrode of the first FET being connected to the current control device.

13. The constant current circuit as claimed in claim 12, wherein the current control device includes a low-pass filter, and the control signal is a variable voltage signal to make the constant current circuit output a desired amount of current as the drain current of the second FET.

14. A method of adjusting the amount of an output current from a constant current circuit, the constant current circuit including a constant voltage source capable of outputting a constant voltage, a first FET, and a second FET, the method comprising:

adjusting the amount of a drain current of the second FET by changing the voltage applied to a gate electrode of the first FET, thereby changing the amount of the output current of the constant current circuit corresponding to the amount of the drain current.